REMARKS

Applicants request a one month extension to respond to the Office Action of September 2, 2008.

Applicants submit this Amendment under 37 CFR 1.114 in support of the Request for Continued Prosecution (RCE) filed concurrently herewith, and in response to the final Office Action mailed from the Patent Office on September 2, 2008, and respectfully request reconsideration of the application in view of the amendments and remarks herein.

The fees for the RCE and one month extension are enclosed. Please deduct any deficiency in the fees from Applicant's attorney's deposit account number 23-0120.

Applicants have taken this opportunity to amend each of the independent claims, i.e., claims 33, 55, 77, 78, 101 and 105-108, to render more clear that the invention is directed to a prefabricated, flexible endodontic dental reinforcement post constructed for fixation within a tooth canal of an endodontically treated tooth including a longitudinal post axis adapted to extend along a tooth canal of a tooth into which it is inserted and displaying a modulus of elasticity along the longitudinal axis of the prefabricated post approximating a modulus of elasticity of a natural tooth structure, wherein the longitudinal axis is 0 degree incident to the dominant fiber directions, for example, as shown in the embodiments of Figs. 12, 12A and 12B. Dependent claims 35, 54 and 85 are also amended to make formal corrections. No new matter has been added. After amendment, claims 33, 35, 38-40, 42, 44-46, 50, 52-55, 58-61, 64, 65, 70-78 and 80-108 remain pending.

In the final Office Action, claims 33, 35, 38, 42, 44-46, 50, 53-55, 58-61, 64, 65, 70, 71, 74-78, 80-82, 84, 85, 88, 89, 91-103 and 105-108, including every independent

claim, were rejected under 35 USC §103(a) over US Patent No. 5,328,372 to Reynaud, et al. (Reynaud) in view of US Patent No. 5,564,929 to Albert (Albert). Claims 34 and 90 are rejected under 35 USC §103(a) over Reynaud and Albert and further in view of US Patent No. 4,936,776 to Kwiatkowski (Kwiatkowski). Claim 39 is rejected under 35 USC §103(a) over Reynaud and Albert and further in view of US Patent No. 5,326,264 to Al Kasem (Al Kasem). Claims 40 and 52 are rejected under 35 USC §103(a) over Reynaud and Albert and further in view of US Patent No. 5,326,263 to Weissman (Weissman). Claims 72 and 73 are rejected under 35 USC §103(a) over Reynaud, Albert and Al Kasem further in view of US Patent No. 4,931,096 to Fujisawa, et al. (Fujisawa). Claims 83, 86 and 87 are rejected under 35 USC §103(a) over Reynaud and Albert and further in view of Al Kasem. Claim 104 is rejected under 35 USC §103(a) over Reynaud and Albert and further in view of US Patent No. 5,282,747 to Nordin (Nordin).

Claims 33, 35, 38, 42, 44-46, 50, 53-55, 58-61, 64, 65, 70, 71, 74, 77, 95, 97-99, 105 and 106 are rejected under 35 USC §103(a) over Reynaud in view of US Patent No. 4,894012 to Goldberg, et al. (Goldberg). Claim 34 is rejected under 35 USC §103(a) over Reynaud and Goldberg and further in view of Kwiatkowski. Claim 39 is rejected under 35 USC §103(a) over Reynaud and Goldberg and further in view of Al Kasem. Claims 40 and 52 are rejected under 35 USC §103(a) over Reynaud and Goldberg and further in view of Weissman. Claims 72 and 73 are rejected under 35 USC §103(a) over Reynaud, Goldberg and Al Kasem further in view of Fujisawa.

Claims 75, 76, 78, 80-82, 84, 85, 88, 89, 91, 96, 100-103, 107 and 108 are rejected under 35 USC §103(a) over Reynaud and Goldberg and further in view of Great Britain Patent No. GB 2214087 to Himmel, et al (Himmel). Claims 83, 86 and 87 are

rejected under 35 USC §103(a) over Reynaud and Goldberg further in view of Fujisawa. Claim 90 is rejected under 35 USC §103(a) over Reynaud in view of Goldberg and Himmel and further in view of Kwiatkowski. Claim 104 is rejected under 35 USC §103(a) over Reynaud, Goldberg and Himmel and further in view of Nordin.

Reynaud and Alpert

Applicants respectfully assert that claims 33-35, 38-40, 42, 44-46, 50, 52-55, 58-61, 64, 65, 70-78 and 80-108 are patentable over Reynaud combined with Albert, whether the combination is taken alone or taken further in view of any combination with Kwiatkowski, Al Kasem, Weissman, Fujisawa and Nordin, for at least the following reasons.

Alpert is not a proper reference under 35 USC §102, and therefore, not a proper reference under 35 USC §103(a). The present application derives from US Patent Application Serial No. 08/126,631, filed September 27, 1983, through a line of continuations and continuations in part (See "Related US Application Data). Alpert, as distinguished, has a filing date of August 17, 1994. Since the limitation directed to glass fibers is provided in the parent application, applicants are entitled to the benefit of the earliest priority date. Alpert, therefore is improper for the teaching of "known alternative materials," such as glass fiber as provided in the present invention as claimed, and applicants respectfully request withdrawal of the rejection of all of the claims under 35 USC §103(a) over Reynaud combined with Alpert.

Assuming Arguendo, however, that Alpert could be found as a proper Section 102, and therefore, a proper Section 103 reference, applicants respectfully assert that their

invention is patentably distinct from the combination of Reynaud and Alpert under section 103(a) for at least the following reasons.

Applicants' independent claims 33, 55, 77, 78, 101 and 105-108, rejected over Reynaud in view of Alpert, set forth an endodontic dental reinforcement post. Independent claim 33, for example, sets forth an endodontic dental reinforcement post comprising a bundle of non-metallic, non-woven fiberglass fibers prefabricated in a cured resin and forming a flexible, reinforced plastic composite. The post is flexible and adapted to extend from an apical end to a coronal end of a tooth canal and having a flexibility approximating a flexibility of a natural tooth structure and a modulus of elasticity along a longitudinal axis of the post approximating a modulus of elasticity of a natural tooth structure. Upon fixation within an endodontically treated tooth, the post relieves stress concentrations within the tooth by shifting of stress concentrations away from an apical end of the endodontically treated tooth under excessive tooth force loads towards a coronal end of the endodontically treated tooth.

Reynaud, as distinguished, discloses a crown-root reconstituting system for reconstituting an endodontically treated tooth. Reynaud's reconstituting system includes a prefabricated dental securing peg or post (1) formed from a composite material comprising high-strength carbon fibers (5) embedded in a resin (4). The prefabricated dental securing peg (1) is constructed by extruding resin (4) around a wick of continuous high performance carbon fibers (5) as the fibers are stressed, allowing the resin to harden and finalizing the peg for insertion by machining in two cylindro-conical parts of differing diameters (6, 8) followed by a truncated part of a frustum of a cone (7, 9), as clearly shown in Fig. 1.

While the Examiner indicates that the "fibers and resin of Reynaud are inherently flexible to some degree," (at page 2 of the final Office Action), applicants respectfully point out that applicants' claimed subject matter is a prefabricated, flexible endodontic dental reinforcement post. Applicants do not claim a wick of non-metallic continuous fibers but non-woven fiberglass fibers prefabricated in a cured resin and forming a flexible, reinforced plastic composite.

Reynaud's prefabricated, hardened and finalized peg is not flexible as are the fibers before being hardened in the resin matrix. That is, the finalized Reynaud peg is first formed by enveloping fibers with a resin, that is allowed to harden, and upon hardening is machine tooled. Carbon is inherently more brittle and less flexible than glass fiber. Hence, Reynaud's hardened cylindro-conical parts and truncated frustum, while prefabricated, cannot be said to be a flexible endodontic dental reinforcement post, as claimed.

For that matter, carbon fiber-based posts exhibit a modulus of elasticity of approximately 130 GPa in a substantially longitudinal axis of a carbon fiber post, as distinguished from glass fiber-based posts exhibit a modulus of elasticity of approximately 17 GPa in a substantially longitudinal axis of a carbon fiber post.

To support same, applicants have had composite glass fiber and resin posts fabricated in the scope of the invention, and composite carbon fiber and resin posts fabricated in the scope of Reynaud[1]. The respective prefabricated glass fiber based and

[1] Please note that Reynaud is not known to have a commercially available product in the US market, so applicants had composite carbon fiber and resin posts fabricated in the scope of Reynaud for testing purposes, which were not finalized for insertion by machining in two cylindro-conical parts of differing

carbon fiber based posts were then tested by an independent Test Lab (See attached Report dated October 27, 2008 by IMR Test Labs, 131 Woodsedge Drive, Lansing Business and Technology Park, Lansing, NY 14882). The October 27, 2008 independent test identifies tensile strength and Modulus of elasticity in 0 degree, 90 degree and 45 degree directions incident to the dominant fiber, i.e., substantially longitudinal, direction.

Reynaud indicates an average of 34 GPa at 20 degrees, an average of 8.5 GPa at 45 degrees, and extrapolates a value of 21 GPa therefrom for 0 degrees. This average ***transverse*** modulus of elasticity is based on "8.5 GPa for an angle of application of the traction effort, with respect to the transverse direction, of 0° and a value of 34 GPa for an angle of 20° which gives an average of 21 GPa in the angular range of 0° to 20°". We find this suspect, and believe that the modulus at 0 degrees in not derived by simply averaging. Angular coordinate measurements cannot be simply added with measurements made in rectangular coordinates.

Although the Reynaud patent submits that this value is close to the modulus of elasticity of dentin, this is still significantly higher than the actual value for tooth dentin, i.e., 18GPa. In the Declaration of Dr. Lawrence Brecht submitted under 37 CFR 1.132, Dr. Brecht describes that the Modulus of Elasticity on dental posts as measured by an INSTRON machine is performed using a vertical pull. Using a vertical pull means that fibers engage more vs. transversely where more resin and less fiber engage the forces. Therefore, the transverse values by definition will be lower due to innate material properties.

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diameters (6, 8) followed by a truncated part of a frustum of a cone (7, 9), as shown in Reynaud's Fig. 1. Consequently, applicants had a composite glass fiber and resin posts fabricated in the scope of its disclosure.

For reinforced composites (such as those made of resin and fiber) applying the testing force at transverse angles other than a vertical orientation would incorporate more resin and less fiber into the results and should not be considered the standard because in any transverse calculation the resin is the weakest link and will skew the results. Therefore the transverse modulus number as applied in Reynaud will always yield a lower modulus than the traditional Instron method. We urge the Examiner to see that the modulus of Reynaud's' peg along the longitudinal axis is at least an order of magnitude higher that the modulus of applicant's invention as claimed, inherent in the carbon based design, as shown in the October 27, 2008 Test Report.

This failing of a carbon fiber post fabricated in the scope of Reynaud's disclosure is not remedied by Alpert even if the Board would deem Alpert to be prior art because Alpert does not teach a prefabricated post. Alpert discloses a ropelike root canal prosthesis and method of use for repairing a damaged tooth. The ropelike root canal prosthesis is moldable to conform to the interior to the root canal. The stiffened rope-like root canal prosthesis is bonded into the root canal and serves as a foundation for restoring the pulp cavity core, and allowing additional prosthesis to be applied to the tooth (See Abstract). Alpert does not disclose a prefabricated, flexible endodontic dental reinforcement post.

The Examiner acknowledges that Reynaud's crown-root reconstituting system and carbon-fiber dental securing peg (1) are distinguishable from applicants' prefabricated, flexible endodontic dental reinforcement post, as claimed. The Examiner nevertheless asserts that the skilled artisan would have thought to combine Albert'

ropelike fibers in a prefabricated peg (1) as taught by Reynaud to realize an endodontic dental reinforcement post, as claimed. Applicants respectfully disagree.

Both Reynaud and applicants' inventions are directed to prefabricated dental posts used in endodontically treated teeth. Alpert teaches the use of carbon of glass based rope as a basis for endodontic treatment, as a filler and support for a root canal that has been cleared of pulp and extraneous matter. The rope is inserted into the root canal, and stiffened or bonded using a stiffening agent, cement or luting agent, and thereby provides adequate support for underlying or overlying filler. While Alpert teaches the use of glass fibers, Alpert does not teach a prefabricated, flexible endodontic dental reinforcement post, as claimed. Alpert teaches no prefabrication of the rope in resin matrix, but adds resin to fill the root canal after the rope (which can comprise glass fibers). There is no prefabrication, and no reference to modulus of elasticity or flexibility of the ropelike structure after insertion either pre-set or post set. There is no post or peg structure.

Neither Albert nor Reynaud teach or suggest that carbon fibers and glass fibers would be "known alternatives" in a post with regard to flexibility and modulus of elasticity comparisons with natural tooth dentin. For at least these reasons, Applicants submit that independent claims 33, 55, 77, 78, 101 and 105-108 are patentable under section 103(a) over Reynaud in combination with Alpert, and the dependent claims 34, 35, 38-40, 42, 44-46, 50, 52-54, 58-61, 64, 65, 70-76 and 80-100 and 102-104 that depend from these claims are patentable of Reynaud and Alpert in any combination with Kwiatkowski, Al Kasem, Weissman, Fujisawa and Nordin.

Reynaud, Alpert and Kwiatkowski

In response to the rejection of claims 34 and 90 under 35 USC §103(a) over Reynaud and Alpert, further in view of Kwiatkowski, applicants respectfully assert that claims 34 and 90 are patentable in view of the asserted combination for at least the reasons set forth above for the patentability of independent claims 33 and 78, from which claims 34 and 90 depend. Applicants, therefore, respectfully request withdrawal of the rejection of claims 34 and 90 under 35 USC §103(a) over Reynaud, Alpert and Kwiatkowski.

Reynaud, Alpert and Al Kasem

In response to the rejection of claim 39 under 35 USC §103(a) over Reynaud and Alpert, further in view of Al Kasem, applicants respectfully assert that claims 39 is patentable in view of the asserted combination for at least the reasons set forth above for the patentability of independent claim 33, from which claims 39 depends. Applicants, therefore, respectfully request withdrawal of the rejection of claim 39 under 35 USC §103(a) over Reynaud, Alpert and Al Kasem.

Reynaud, Alpert and Weissman

In response to the rejection of claims 40 and 52 under 35 USC §103(a) over Reynaud and Alpert, further in view of Weissman, applicants respectfully assert that claims 40 and 52 are patentable in view of the asserted combination for at least the reasons set forth above for the patentability of independent claim 33, from which claims

40 and 52 depend. Applicants, therefore, respectfully request withdrawal of the rejection of claims 40 and 52 under 35 USC §103(a) over Reynaud, Alpert and Weissman.

Reynaud, Alpert, Al Kasem and Fujisawa

In response to the rejection of claims 72 and 73 under 35 USC §103(a) over Reynaud, Alpert and Al Kasem, further in view of Fujisawa, applicants respectfully assert that claims 72 and 73 are patentable in view of the asserted combination for at least the reasons set forth above for the patentability of independent claim 33, from which claims 72 and 73 depend. Applicants, therefore, respectfully request withdrawal of the rejection of claims 72 and 73 under 35 USC §103(a) over Reynaud, Alpert, Al Kasem and Fujisawa.

Reynaud, Alpert and Al Kasem

In response to the rejection of claims 83, 86 and 87 under 35 USC §103(a) over Reynaud, Alpert and further in view of Al Kasem, applicants respectfully assert that claims 83, 86 and 87 are patentable in view of the asserted combination for at least the reasons set forth above for the patentability of independent claim 78, from which claims 83, 86 and 87 depend. Applicants, therefore, respectfully request withdrawal of the rejection of claims 83, 86 and 87 under 35 USC §103(a) over Reynaud, Alpert and Al Kasem.

Reynaud, Alpert and Nordin

In response to the rejection of claim 104 under 35 USC §103(a) over Reynaud and Alpert, further in view of Fujisawa, applicants respectfully assert that claim 104 is patentable in view of the asserted combination for at least the reasons set forth above for the patentability of independent claim 101, from which claim 104 depends. Applicants, therefore, respectfully request withdrawal of the rejection of claim 104 under 35 USC §103(a) over Reynaud, Alpert and Nordin.

Reynaud and Goldberg

Applicants respectfully assert that claims 33, 35, 38, 42, 44-46, 50, 53-55, 58-61, 64, 65, 70, 71, 74, 77, 95, 97-99, 105 and 106 are patentable over Reynaud combined with Goldberg, whether the combination is taken alone or taken further in view of any combination with Kwiatkowski, Al Kasem, Weissman, Fujisawa and Nordin, for at least the following reasons.

Applicants' independent claims 33, 55, 77, 101, 105 and 106, rejected over Reynaud and Goldberg, set forth an endodontic dental reinforcement post. Independent claim 77, for example, sets forth an endodontic dental reinforcement post for endodontic and reconstructive pin therapy that comprises a prefabricated, flexible fiberglass reinforced plastic composite consisting essentially of a bundle of fiberglass fibers adapted to extend from an apical end to a coronal end of a tooth canal of an endodontically treated tooth into which said post is fixated. The post has a flexibility approximating a flexibility of a natural tooth structure of the endodontically treated tooth and a modulus of elasticity along a longitudinal axis of the post approximating a modulus of elasticity of a natural

tooth structure of the endodontically treated tooth. The post relieves stress concentrations within the endodontically treated tooth into which it is fixated by shifting of stress concentrations away from an apical end of the endodontically treated tooth under excessive tooth force loads to a coronal end of the endodontically treated tooth.

Reynaud was described in detail above with reference to the October 27, 2008 Test Report.

Goldberg discloses a dental appliance system that may be used as an orthodontal retainer, orthodontal bridge, orthodontal space retainer, orthodontal splint and like orthodontal fabrications. The orthodontal fabrications include a structural component formed of fiber-reinforced composite material. The fiber-reinforced material comprises fiber immersed in a polymeric matrix, and a modulus of elasticity of grater than 0.5 $x10^6$ psi. Goldberg is not directed to endodontic structure, such as the Alpert ropelike prosthesis used in endodontic treatment, or the Reynaud prefabricated post endodontic treatment carbon fiber post. Goldberg is not directed to an endodontic dental reinforcement post constructed for endodontic and reconstructive pin therapy that comprises a prefabricated, flexible fiberglass reinforced plastic composite, as claimed.

An appliance that is used externally of a tooth structure, (i.e., orthodontally), such as Goldberg's, is constructed or fabricated based on inherently different structural concerns than an endodontic device inserted into the actual tooth structure. When a post is placed within the tooth structure, special attention must be taken into consideration regarding the effect of the post on the tooth and its susceptibility to fracture. While Goldberg teaches "common alternative materials," it is not endodontic and gives no criticality to the use of fiberglass.

Applicants unexpectedly discovered that the use of fiberglass fibers is critically important in a prefabricated post inserted after endodontic treatment because of the flexibility required to coordinate strength with the natural flexibility of the tooth structure, i.e., dentin. With all due respect, the Examiner may be imparting this claimed property to Goldberg using impermissible hindsight and applicants' own specification to arrive at his conclusion.

For at least these reasons, Applicants submit that independent claims 33, 55, 77, 105 and 106 are patentable under section 103(a) over Reynaud in combination with Goldberg, and the dependent claims 35, 38, 42, 44-46, 50, 53-54, 58-61, 64, 65, 70, 71, 74, 95 and 97-99 that depend from these claims are patentable of Reynaud and Goldberg in any combination with Kwiatkowski, Al Kasem, Weissman, Fujisawa and Nordin, for at least the following reasons.

Reynaud, Goldberg and Kwiatkowski

In response to the rejection of claim 34 under 35 USC §103(a) over Reynaud and Goldberg further in view of Kwiatkowski, applicants respectfully assert that claim 34 is patentable in view of the asserted combination for at least the reasons set forth above for the patentability of independent claim 33 from which claim 34 depends. Applicants, therefore, respectfully request withdrawal of the rejection of claims 34 under 35 USC §103(a) over Reynaud, Goldberg and Kwiatkowski.

Reynaud, Goldberg and Al Kasem

In response to the rejection of claims 39 under 35 USC §103(a) over Reynaud and Goldberg, further in view of Al Kasem, applicants respectfully assert that claim 39 is patentable in view of the asserted combination for at least the reasons set forth above for the patentability of independent claim 33, from which claim 39 depends. Applicants, therefore, respectfully request withdrawal of the rejection of claim 39 under 35 USC §103(a) over Reynaud, Goldberg and Al Kasem.

Reynaud, Alpert and Weissman

In response to the rejection of claims 40 and 52 under 35 USC §103(a) over Reynaud and Goldberg, further in view of Weissman, applicants respectfully assert that claims 40 and 52 are patentable in view of the asserted combination for at least the reasons set forth above for the patentability of independent claim 33, from which claims 40 and 52 depend. Applicants, therefore, respectfully request withdrawal of the rejection of claims 40 and 52 under 35 USC §103(a) over Reynaud, Goldberg and Weissman.

Reynaud, Goldberg, Al Kasem and Fujisawa

In response to the rejection of claims 72 and 73 under 35 USC §103(a) over Reynaud, Goldberg and Al Kasem, further in view of Fujisawa, applicants respectfully assert that claims 72 and 73 are patentable in view of the asserted combination for at least the reasons set forth above for the patentability of independent claim 33, from which claims 72 and 73 depend. Applicants, therefore, respectfully request withdrawal of the

rejection of claims 72 and 73 under 35 USC §103(a) over Reynaud, Goldberg, Al Kasem and Fujisawa.

Reynaud, Goldberg and Himmel

Applicants respectfully assert that claims 75, 76, 78, 80-82, 84, 85, 88, 89, 91, 96, 100-103, 107 and 108 are patentable over Reynaud and Goldberg combined with Himmel, whether the combination is taken alone or taken further in view of any combination with Kwiatkowski, Al Kasem, Weissman, Fujisawa and Nordin.

Applicants' independent claims 78, 107 and 108, rejected over Reynaud and Goldberg in view of Himmel set forth an endodontic dental reinforcement post. Independent claim 77, for example, sets forth a prefabricated dental post consisting essentially of bundles of twisted fiberglass reinforced plastic fibers in a cured resin composite for insertion into a root canal of an endodontically treated tooth. The post has a flexibility approximating a flexibility of a natural tooth and a modulus of elasticity approximating a modulus of elasticity of a natural tooth structure. The post relieves stress concentrations within a tooth structure of said endodontically treated tooth into which it is inserted by shifting of stress concentrations away from an apical end of the endodontically treated tooth under excessive tooth force loads to a coronal end of the endodontically treated tooth.

Since Himmel is only used as a reference to teach twisting fibers, applicants submit that the independent claims 78, 107 and 108, and dependent claims 75, 76, 80-82, 84, 85, 88, 89, 91, 96, 100, 102 and 103 that depend from claims 33, 55, 78 are allowable for at least the same reasons as provided above during the discussion of Reynaud and

Goldberg. Applicants, therefore, respectfully request withdrawal of the rejection of claims 75, 76, 78, 80-82, 84, 85, 88, 89, 91, 96, 100-103, 107 and 108 under 35 USC §103(a) over Reynaud and Goldberg in view of Himmel.

Reynaud, Goldberg, Himmel and Fujisawa

In response to the rejection of claims 83, 86 and 87 under 35 USC §103(a) over Reynaud and Goldberg further in view of Fujisawa, applicants respectfully assert that claims 83, 86 and 87 are patentable in view of the asserted combination for at least the reasons set forth above for the patentability of independent claim 78 from which these claims depend. Applicants, therefore, respectfully request withdrawal of the rejection of claims 83, 86 and 87 under 35 USC §103(a) over Reynaud, Goldberg, Himmel and Fujisawa.

Reynaud, Goldberg, Himmel and Kwiatkowski

In response to the rejection of claim 90 under 35 USC §103(a) over Reynaud, Goldberg and Himmel, further in view of Kwiatkowski, applicants respectfully assert that claim 90 is patentable in view of the asserted combination for at least the reasons set forth above for the patentability of independent claim 78 from which claim 90 depends. Applicants, therefore, respectfully request withdrawal of the rejection of claim 90 under 35 USC §103(a) over Reynaud, Goldberg, Himmel and Kwiatkowski.

Reynaud, Goldberg, Himmel and Nordin

In response to the rejection of claim 104 under 35 USC §103(a) over Reynaud, Goldberg and Himmel, further in view of Nordin, applicants respectfully assert that claim 104 is patentable in view of the asserted combination for at least the reasons set forth above for the patentability of independent claim 101 from which claim 104 depends. Applicants, therefore, respectfully request withdrawal of the rejection of claim 104 under 35 USC §103(a) over Reynaud, Goldberg, Himmel and Nordin.

For the reasons provided above, Applicants submit that the claims are now in condition for allowance, which action is respectfully solicited.

Respectfully submitted,

Date: January 2, 2009

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CERTIFICATE OF EXPRESS MAIL

I hereby certify that this correspondence including Request for Continued Examination and Amendment with request for one month extension are being deposited by Express Mail number EM 351246805 US in an envelope addressed to Commissioner for Patents, PO Box 1450, Alexandria VA 22313-1450 on the date indicated below.

Date: January 2, 2009

Alfred Walker

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Original Date
October 23, 2008

Revised Date
November 4, 2008

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157 Wickapogue Road
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PO Number
Credit Card

Date Received
October 6, 2008

Description
2 - 12" x 12" x 1/8" Glass Fiber and Polyester Resin Samples
1 - 12" x 36" x 0.060" 0 Degree Parallel Orientation Carbon Fiber and Epoxy Resin Samples

Specification(s)
ASTM D 3039/D3039M-00 (modified)
(Reapproved 2006)

TEST REPORT

IMR Report Number 200809426 - Revision 2 (customer request)

SUMMARY

Two types of composite post material samples were received for tensile testing in the 0°, 90°, and 45° directions incident to the dominant fiber direction. Specimens were conditioned to constant weight per ASTM D5229/D5229M-92 (2004) (modified) prior to testing.

Plastic tabs were added to the samples, excluding the 0° Glass fiber and polyester resin set, in order to obviate grip-induced failure.

The results are on the following page(s).

ACCREDITED 1140.01 • 1140.02

Accredited Nadcap Materials Testing Laboratory

Reviewed by
John DeFranks
Nonmetallics Specialist

Reviewed by
Michael Bimbo, Manager
Nonmetallics Department

TENSILE STRENGTH AND MODULUS OF ELASTICITY

Glass Fiber and Polyester Resin Samples

Sample		Tensile Strength (GPa)	Modulus of Elasticity (GPa)	Failure Mode*
0°	1	0.31	19	Explosive, Gage, Top
	2	0.34	17	Explosive, Gage, Top
	3	0.21	15	Edge Delamination, Gage, Bottom
	4	0.31	17	Lateral, Gage, Various Locations
	5	0.32	19	Lateral, At Grip, Top
Average		0.30	17	--
Std. Dev.		0.05	2	--
90°	1	75E-03	6.9	Lateral, At Tab, Bottom
	2	75E-03	6.9	Lateral, Gage, Top
	3	75E-03	6.9	Lateral, <1Width From Tab, Bottom
	4	85E-03	8.3	Lateral, Gage, Bottom
	5	85E-03	9.0	Lateral, At Tab, Bottom
Average		79E-03	7.6	--
Std. Dev.		4.4E-03	0.1	--
45°	1	89E-03	13	Angled, Gage, Bottom
	2	97E-03	7.6	Angled, Gage, Top
	3	83E-03	7.6	Angled, Gage, Bottom
	4	97E-03	9.0	Angled, Gage, Middle
	5	90E-03	7.6	Angled, Gage, Bottom
Average		91E-03	9.0	--
Std. Dev.		6E-03	2	--

*See Figure 1.

Crosshead speed 0.1 in/min

MODULUS OF ELASTICITY - CONTINUED

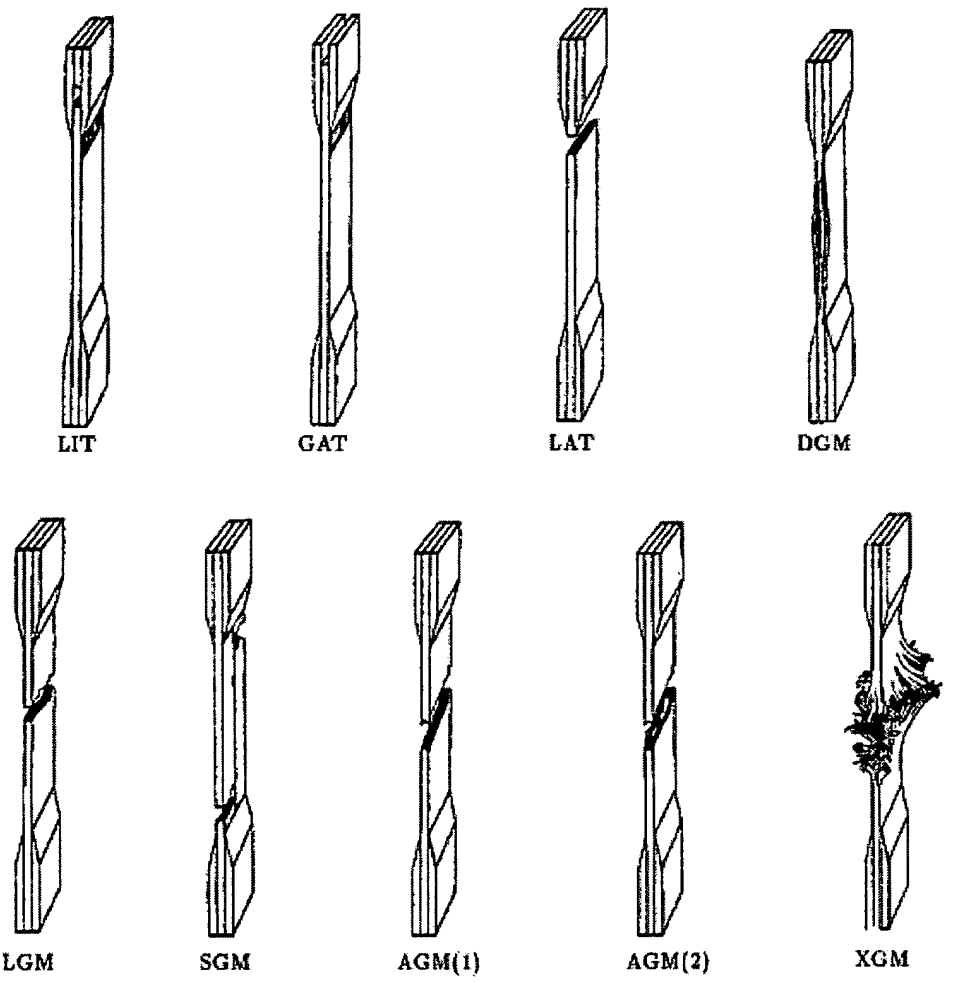
0 Degree Parallel Orientation Carbon Fiber and Epoxy Resin Samples

Sample		Tensile Strength (GPa)	Modulus of Elasticity (GPa)	Failure Mode*
0°	1	19	130	Explosive, Gage, Various
	2	15	120	Explosive, Gage, Various
	3	14	120	Explosive, Gage, Various
	4	1.1	120	Explosive, At Tab, Bottom
	5	--	--	Specimen Excluded Due to Equipment Failure
Average		12	130	--
Std. Dev.		7.8	4.0	--
90°	1	10E-03**	6.3**	Lateral, Gage, Top
	2	14E-03	6.8	Lateral, Gage, Top
	3	14E-03	6.9	Lateral, Gage, Top
	4	7.6E-03	6.5	Lateral, Gage, Top
	5	4.3E-03	4.4	Lateral, Gage, Top
Average		9.98E-03	6.5	--
Std. Dev.		4.2E-03	0.3	--
45°	1	33E-03	9.0	Angled, Gage, Bottom
	2	24E-03	8.3	Angled, Gage, Bottom
	3	19E-03	9.7	Angled, Gage, Top
	4	30E-03	9.0	Angled, Gage, Top and Bottom
	5	29E-03	8.3	Angled, Gage, Top
Average		27E-03	8.9	--
Std. Dev.		5.5E-03	0.6	--

*See Figure 1.

**Tested with 10,000 lb. capacity load cell.

Crosshead speed 0.1 in/min



First Character

Failure Type	Code
Angled	A
edge Delamination	D
Grip/tab	G
Lateral	L
Multi-mode	M(xyz)
long. Splitting	S
eXplosive	X
Other	O

Second Character

Failure Area	Code
Inside grip/tab	I
At grip/tab	A
<1W from grip/tab	W
Gage	G
Multiple areas	M
Various	V
Unknown	U

Third Character

Failure Location	Code
Bottom	B
Top	T
Left	L
Right	R
Middle	M
Various	V
Unknown	U

Figure 1: Guide, as presented in ASTM D 3039-00, on how to interpret and categorize failure mode.